PLEASE AMEND THE CLAIMS AS FOLLOW:

1. (Previously Presented) A switching system having an input and an output, the switching system further comprising:

a first communications switch and a second communications switch connected by at least one communications link, comprising at least one channel, for transmitting a plurality of data units through said communications link to the output of the switching system;

a common time reference (CTR);

means for deriving the CTR from a Coordinated Universal Time (UTC) standard;

wherein each of the communications switches is further comprised of a plurality of input ports and a plurality of output ports, each of the input ports connected to and receiving data units from the communications link over at least one of the channels, and each of the output ports connected to and transmitting data units to the communications link over at least one of the channels;

wherein each of the communications switches has a switch controller, coupled to the CTR, the respective input ports, and the respective output ports;

wherein each of the communications switches has an optical interconnection subsystem coupled to the respective switch controller, the respective input ports, and the respective output ports;

wherein the CTR is divided into a plurality of contiguous periodic super cycles (SCs) each comprised of at least one time cycle (TC) each comprised of at least one time frame (TF);

wherein the super cycle is one of a single UTC second, a predefined integer number of UTC seconds, and a fraction of one UTC second;

wherein each of the switch controllers defines the coupling from each one of the respective input ports for data units received during any one of the time frames, on a respective one of the channels, for output during a predefined time frame to at least one selected one of the respective output ports on at least one selected respective one of the channels; and

wherein each of the switch controllers is responsive to the CTR for configuring the optical interconnection subsystem wherein the optical interconnection subsystem is coupled to the input ports via a wavelength conversion subsystem.

2. (Previously Presented) The system as in claim 1, wherein the data units output during a first predefined time frame on a selected respective one of the channels through the respective output port of the first communications switch are forwarded through the respective output port of the second communications switch during a second predefined time frame on a selected respective one of the channels responsive to the CTR.

3. (Previously Presented) The system as in claim 1, the optical interconnection subsystem further comprising at least one of:

a plurality of star couplers, a plurality of tunable receivers, a plurality of lasers, and a plurality of wavelength division multiplexers WDM MUXs; and

wherein each of the switch controllers is responsive to the CTR for receiving data units on a predefined optical channel.

4. (Previously Presented) The system as in claim 3, the optical interconnection subsystem, further comprising:

a plurality of star couplers, a plurality of tunable receivers, a plurality of lasers, and a plurality of wavelength division multiplexers WDM MUXs;

wherein the communications links are coupled to the star couplers;

wherein the star couplers are coupled to the tunable receivers;

wherein the tunable receivers are coupled to the lasers; and

wherein the lasers are coupled to the WDM MUXs.

5. (Previously Presented) The system as in claim 3, the optical interconnection subsystem further comprising:

a plurality of star couplers;

wherein the communications links are divided into a plurality of subsets; and

wherein each of the subsets of the communications links is coupled to each of the star couplers.

6. (Canceled)

7. (Previously Presented) The system as in claim 3, the optical interconnection subsystem, further comprising:

a plurality of star couplers and a plurality of tunable receivers;

wherein each star coupler has a plurality of outgoing optical links; and

wherein each of said outgoing optical links is connected to a selected at least one of the plurality of tunable receivers.

8. (Previously Presented) The system as in claim 3, the optical interconnection subsystem, further comprising:

a plurality of lasers and a plurality of wavelength division multiplexers WDM MUXs;

wherein each of the WDM MUX has a plurality of incoming optical links; and

wherein each of said incoming optical links is connected to a selected at least one of the plurality of lasers.

9. (Previously Presented) The system as in claim 3, wherein each input port is further comprised of at least one star coupler.

10. (Previously Presented) The system as in claim 3, the optical interconnection subsystem, further comprising:

a plurality of star couplers; and

wherein each star coupler is used by at least one input port.

11. (Previously Presented) The system as in claim 3, wherein each output port is further comprised of at least one WDM MUX.

12. (Original) The system as in claim 3, wherein each WDM MUX is used by at least one output port.

13. (Previously Presented) The system as in claim 3, the optical interconnection subsystem, further comprising:

a plurality of lasers; and wherein a selected at least one of the plurality of lasers is a tunable laser; and

wherein each of the switch controllers is responsive to the CTR for tuning the tunable lasers for transmitting data units on a predefined optical channel.

14. (Previously Presented) The system as in claim 3, the optical interconnection subsystem, further comprising:

a plurality of tunable receivers; and

wherein for each time frame within the time cycle, at least one of the plurality of tunable receivers is tuned by the switch controllers for receiving data units on a predefined optical channel.

15. (Previously Presented) The system as in claim 3, the optical interconnection subsystem, further comprising:

a plurality of tunable receivers; and

wherein for each time frame within the super cycle, at least one of the plurality of tunable receivers is tuned by the switch controllers for receiving data units on a predefined optical channel.

16. (Previously Presented) The system as in claim 13, wherein for each time frame within the time cycle at least one of the plurality of tunable lasers is tuned by the switch controllers for transmitting data units on a predefined optical channel.

17. (Previously Presented) The system as in claim 13, wherein for each time frame within the super cycle at least one of the plurality of tunable lasers is tuned by the switch controllers for transmitting data units on a predefined optical channel.

18. (Original) The system as in claim 3, wherein the plurality of input ports each receives data units over at least one of a plurality of incoming channels (*j*); and

wherein each of the incoming channels (*j*) has a unique time reference (UTR-j) that is phase independent of the CTR.

19. (Previously Presented) The system as in claim 18, further comprising:

a plurality of alignment subsystems;

wherein the UTR-j is divided into UTR-j super cycles (SC); wherein the UTR-j super cycles are divided into UTR-j time cycles (TC); and wherein the UTR-j time cycles are divided into UTR-j time frames (TF); and

wherein a respective one of the alignment subsystems aligns UTR-j to CTR, according to at least one of the following: UTR-j TF to CTR TF, UTR-j TC to CTR TC, UTR-j SC to CTR SC.

20. (Previously Presented) The system as in claim 19, the optical interconnection subsystem, further comprising:

a plurality of star couplers; and

wherein at least one of the plurality of alignment subsystems is located before each input of at least one of the plurality of star couplers.

21. (Previously Presented) The system as in claim 19, the optical interconnection subsystem, further comprising:

a plurality of tunable receivers and a plurality of lasers; and

wherein at least one of the plurality of alignment subsystems is located between the output of at least one of the plurality of tunable receivers and the input of at least one of the plurality of lasers.

22. (Canceled)

23. (Previously Presented) The system as in claim 1, the means for obtaining the UTC , further comprising at least one of: a Global Positioning System (GPS), Global Navigation Satellite System – GLONASS, and Galileo.

24. (Previously Presented) The system as in claim 1, the optical interconnection subsystem further comprising:

a plurality of optical alignment subsystems, a plurality of star couplers, a plurality of wavelength converters (WLC), and a plurality of WDM MUXs; and

wherein each of the switch controllers is responsive to the CTR for tuning the WLCs for converting from a first predefined wavelength to a second predefined wavelength.

25. (Original) The system as in claim 24,

wherein the communications links are coupled to the optical alignment subsystems;

wherein the optical alignment subsystems are coupled to the star couplers;

wherein the star couplers are coupled to the WLCs; and

wherein the WLCs are coupled to the WDM MUXs.

26. (Previously Presented) The system as in claim 1, the optical interconnection subsystem, further comprising:

a plurality of optical alignment subsystems, a plurality of star couplers, a plurality of tunable receivers, a plurality of lasers, a plurality of optical cross connects (OXCs), and a plurality of WDM MUXs;

wherein each of the switch controllers is responsive to the CTR for tuning the tunable receivers for receiving data units on a predefined optical channel; and

wherein each of the switch controllers is responsive to the CTR for configuring the OXCs.

27. (Previously Presented) The system as in claim 26,

wherein said at least one communications link is coupled to one of the plurality of optical alignment subsystems;

wherein at least one of the plurality of optical alignment subsystems is coupled to one of the plurality of star couplers;

wherein at least one of the plurality of star couplers is coupled to one of the plurality of tunable receivers;

wherein at least one of the plurality of tunable receivers is coupled to one of the plurality of lasers;

wherein at least one of the plurality of lasers is coupled to one of the plurality of OXCs; and

wherein at least one of the plurality of OXCs is coupled to one of the plurality of WDM MUXs.

28. (Previously Presented) The system as in claim 26, wherein one of the plurality of OXCs is at least one of: an optical cross-bar, an optical banyan network, a Lithium-Niobate optical switch, an Indium Phosphate optical switch, a 2-D MEMS optical switch, a 3-D MEMS optical switch, a semiconductor optical amplifier (SOA) based optical switch, an holographic optical switch, and bubble optical switch.

29. (Previously Presented) The system as in claim 1, further comprising:

a plurality of optical alignment subsystems, a plurality of star couplers, a plurality of wavelength converters (WLC), a plurality of star couplers for broadcast, a plurality of first WDM MUXs, a plurality of filters, and a plurality of second WDM MUXs;

wherein each of the switch controllers is responsive to the CTR for tuning the WLCs for converting from a first predefined wavelength to a second predefined wavelength; and

wherein each of the switch controllers is responsive to the CTR for configuring the optical interconnection subsystem.

30. (Previously Presented) The system as in claim 29,

wherein said at least one communications link is coupled to one of the plurality of optical alignment subsystems;

wherein at least one of the plurality of optical alignment subsystems is coupled to one of the plurality of star couplers;

wherein at least one of the plurality of star couplers is coupled to one of the plurality of WLCs;

wherein at least one of the plurality of WLCs is coupled to one of the plurality of star couplers;

wherein at least one of the plurality of star couplers is coupled to one of the plurality of first WDM MUXs;

wherein at least one of the plurality of first WDM MUXs coupled to said at least one star couplers is coupled to one of the plurality of filters; and

wherein at least one of the plurality of filters is coupled to one of the plurality of second WDM MUXs.

31. (Previously Presented) The system as in claim 29, wherein at least one of the plurality of WLCs is further comprised of a tunable receiver and a tunable laser; and

wherein the tunable receiver and the tunable laser are controlled responsive to the CTR.

32. (Currently Amended) A switching system comprising:

a common time reference (CTR);

means for deriving the CTR from a Coordinated Universal Time (UTC) standard;

wherein the CTR is divided into a plurality of contiguous periodic super cycles;

wherein the super cycle is one of a single UTC second, a predefined integer number of UTC seconds, and a fraction of one UTC second;

a plurality of optical links, each carrying a plurality of optical channels, wherein each of the optical channels is carried on a defined first wavelength;

a plurality of wavelength conversion subsystems each coupled to a respective one of the plurality of optical links;

wherein each wavelength conversion subsystem selectively converts from the first wavelength to a second wavelength, responsive to the CTR, to provide a respective output of a second optical link carrying the second wavelength;

a plurality of wavelength division multiplexers (WDMs), each having a plurality of optical channel inputs;

an optical interconnection subsystem for coupling the second optical links to selected ones of the optical channel inputs of an associated one of the WDM's; and

wherein each of the WDMs multiplexes its respective plurality of optical channel inputs to at least one respective output optical link.

33. (Previously Presented) The system as in claim 32, wherein the CTR is comprised of a plurality of time frames, wherein the wavelength conversion subsystem is further comprised of:

a Wavelength Conversion (WLC) scheduling controller comprising a wavelength mapping table defining the associative mapping between the first wavelength and the second wavelength for each of the time frames; and

a tunable wavelength conversion subsystem for converting, for each of the time frames, the first wavelength into the second wavelength, responsive to the WLC scheduling controller.

34. (Previously Presented) The system as in claim 33, wherein the tunable wavelength conversion subsystem is further comprised of:

a tunable receiver, responsive to the WLC scheduling controller, for providing an electrical signal output representative of the first wavelength; and

a laser, responsive to the electrical signal output, for transmitting as an output an optical signal of the second wavelength representative of the first wavelength.

35. (Previously Presented) The system as in claim 34, wherein the laser is a tunable laser, responsive to the WLC scheduling controller, for providing an optical output of the second wavelength.

36. (Previously Presented) The system as in claim 33, further comprising:

an alignment subsystem coupled between the tunable receiver and the laser, responsive to the CTR, for aligning a beginning of each of the time frames with the CTR.

37. (Previously Presented) The system as in claim 32, wherein the optical interconnection subsystem is a fixed set of fiber connections.

38. (Previously Presented) The system as in claim 32, wherein the optical interconnection subsystem is programmable.

39. (Previously Presented) The system as in claim 38, wherein the programmable optical interconnection subsystem is comprised of an optical cross-connect (OXC), and is responsive to the CTR.

40. (Previously Presented) The system as in claim 39, wherein each of the OXCs is at least one of: an optical cross-bar, an optical banyan network, a Lithium-Niobate optical switch, an Indium Phosphate optical switch, a 2-D MEMS optical switch, a 3-D MEMS optical switch, a

semiconductor optical amplifier (SOA) based optical switch, an holographic optical switch, and bubble optical switch.

41. (Currently Amended) A switching system comprising:

a common time reference (CTR);

means for deriving the CTR from a Coordinated Universal Time (UTC) standard;

wherein the CTR is divided into a plurality of contiguous periodic super cycles;

wherein the super cycle is one of a single UTC second, a predefined integer number of UTC seconds, and a fraction of one UTC second;

a plurality of wavelength division multiplexing (WDM) optical links, each carrying a plurality of optical channels, wherein each of the optical channels is carried on a defined first wavelength;

a plurality of multiple wavelength conversion subsystems (MWLCs) each coupled to a respective one of the plurality of optical links;

wherein each of the plurality of MWLCs selectively converts from a plurality of first wavelengths to a respective plurality of second wavelengths, responsive to the CTR,

wherein each of the plurality of MWLCs provides a respective output of a second optical link carrying a plurality of the second wavelengths; and

a wavelength grating router (WGR) for coupling each of the plurality of wavelengths carried on the respective second optical link to at least one respective optical link output.

42. (Previously Presented) The system as in claim 41, wherein the CTR is comprised of a plurality of time frames, the MWLC further comprising:

a MWLC scheduling controller responsive to the CTR for defining the associative mapping between at least one of the plurality of first wavelengths with associated

respective time frames and at least one of the plurality of second wavelengths with associated respective time frames; and

a tunable multiple wavelength conversion subsystem for converting, for each of the associated respective time frames, at least one of the plurality of first wavelengths into at least one of the plurality of second wavelengths responsive to the MWLC scheduling controller.

43. (Currently Amended) The system as in claim 42, the tunable multiple wavelength conversion subsystem further comprising:

a wavelength division demultiplexer (WDD), a plurality of tunable wavelength conversion subsystems (TWLCs), and a wavelength division multiplexer ~~(WDM).~~(WDM); and

wherein at least one of the plurality of tunable wavelength conversion subsystems converts, for each of the time frames, a first wavelength into a second wavelength responsive to the MWLC scheduling controller.

44. (Previously Presented) The system as in claim 43, the tunable wavelength conversion subsystem further comprising:

a tunable receiver, responsive to the WLC scheduling controller, for providing an electrical signal output representative of at least one of the plurality of first wavelengths; and

a laser, responsive to the electrical signal output, for transmitting as an optical signal output of at least one of the plurality of second wavelengths representative of at least one of the plurality of first wavelengths.

45. (Previously Presented) The system as in claim 44, wherein the laser is a tunable laser for providing an optical output of at least one of the plurality of second wavelengths.

46. (Previously Presented) The system as in claim 44, further comprising:

an alignment subsystem coupled between the tunable receiver and the laser, responsive to the CTR, for aligning a beginning of each of the plurality of time frames with the CTR.

47. (Previously Presented) The system as in claim 42, wherein the tunable multiple wavelength conversion subsystem is further comprised of:

a star coupler, a plurality of tunable wavelength conversion subsystems (TWLCs), and a wavelength division multiplexer (WDM); and

wherein at least one of the plurality of tunable wavelength conversion subsystems converts, for each of the time frames, a first wavelength into a second wavelength responsive to the MWLC scheduling controller.

48. (Previously Presented) The system as in claim 47, wherein the tunable wavelength conversion subsystem is further comprised of:

a tunable receiver, responsive to the WLC scheduling controller, for providing an electrical signal representative of the first wavelength; and

a laser, responsive to the electrical signal output, for transmitting an optical signal output of the second wavelength, wherein the optical signal output of the second wavelength is representative of the first wavelength.

49. (Previously Presented) The system as in claim 48, wherein the laser is a tunable laser for providing an optical output of the second wavelength.

50. (Previously Presented) The system as in claim 48, further comprising:

an alignment subsystem coupled between the tunable receiver and the laser, responsive to the CTR, for aligning a beginning of each of the plurality of time frames with the CTR.

51. (Previously Presented) A switching method for a switching system having an input and an output, said method comprising:

coupling a first communications switch and a second communications switch with at least one communications link comprising at least one of a plurality of channels, wherein the first communications switch and the second communications switch are further comprised of a plurality of input ports and a plurality of output ports and an optical interconnection subsystem;

transmitting a plurality of data units through said communications link to the output of the switching system;

coupling each of the plurality of input ports for receiving data units from the communications link over at least one of the channels;

coupling each of the plurality of output ports for transmitting data units to the communications link over at least one of the channels;

coupling the optical interconnection subsystem of the respective communications switches to the respective switch controller, the respective input ports, and the respective output ports;

the method further comprising:

providing a common time reference (CTR) derived from a Coordinated Universal Time (UTC) standard; dividing the CTR into a plurality of contiguous periodic super cycles (SCs) each comprised of at least one time cycle (TC) each comprised of at least one time frame (TF);

defining the coupling from each of the respective input ports for data units received during at least one of the plurality of time frames, on a respective one of the channels, for output during a predefined time frame to at least one selected one of the said respective output ports on at least one selected respective one of the plurality of channels; and

configuring the optical interconnection subsystem for coupling to the input ports via a wavelength conversion subsystem.

52. (Previously Presented) The method as in claim 51, further comprising:

outputting the data units during a first predefined time frame via a selected respective one of said at least one plurality of the channels from the respective output port of the first communications switch; and

forwarding the data units from the respective output port of the second communications switch during a second predefined time frame via a selected respective one of the channels responsive to the CTR.

53. (Previously Presented) The method as in claim 51, wherein the optical interconnection subsystem is further comprised of a plurality of tunable receivers, the method further comprising:

tuning the tunable receivers for receiving data units on a predefined optical channel responsive to the CTR.

54. (Previously Presented) The method as in claim 53, further comprising:

coupling the at least one of the plurality of communications links to one of the plurality of star couplers;

coupling at least one of the plurality of star couplers to one of the plurality of tunable receivers;

coupling at least one of the plurality of tunable receivers to one of a plurality of lasers; and

coupling at least one of the plurality of lasers to one of a plurality of Wavelength Division Multiplexers (WDM MUXs).

55. (Previously Presented) The method as in claim 54, further comprising:

dividing the communications links into a plurality of subsets; and

coupling each of the subsets of the communications links to each of the star couplers.

56. (Previously Presented) The method as in claim 54, wherein each of the plurality of star couplers has a plurality of outgoing optical links, the method further comprising:

connecting each of said outgoing optical links to a selected one of the plurality of tunable receivers.

57. (Previously Presented) The method as in claim 54, wherein at least one of the plurality of WDM MUXs has a plurality of incoming optical links, the method further comprising:

connecting each of said incoming optical links to a selected one of the plurality of lasers.

58. (Previously Presented) The method as in claim 53, further comprising:

tuning, for each time frame within the time cycle, each of the tunable receivers for receiving data units on a predefined optical channel.

59. (Previously Presented) The method as in claim 51, wherein the optical interconnection subsystem is further comprised of a plurality of optical alignment subsystems, a plurality of star couplers, a plurality of wavelength converters (WLCs), and a plurality of WDM MUXs, the method further comprising:

tuning the WLCs for converting from a first predefined wavelength to a second predefined wavelength responsive to the CTR.

60. (Previously Presented) The method as in claim 59, further comprising:

coupling at least one of the plurality of communications links to one of the plurality of optical alignment subsystems;

coupling at least one of the plurality of optical alignment subsystems to one of the plurality of star couplers;

coupling at least one of the plurality of star couplers to one of the plurality of WLCs; and

coupling at least one of the plurality of WLCs to one of the plurality of WDM MUXs.

61. (Previously Presented) The method as in claim 51, wherein the optical interconnection subsystem is further comprised of a plurality of optical alignment subsystems, a plurality of star couplers, a plurality of tunable receivers, a plurality of lasers, a plurality of optical cross connects (OXCs), and a plurality of WDM MUXs, the method further comprising:

tuning the tunable receivers for receiving data units on a predefined optical channel responsive to the CTR; and

configuring the OXCs responsive to the CTR.

62. (Previously Presented) The method as in claim 61, further comprising:

selectively coupling the plurality of communications links to the plurality of optical alignment subsystems;

selectively coupling the plurality of optical alignment subsystems to the plurality of star couplers;

selectively coupling the plurality of star couplers are coupled to the plurality of tunable receivers;

selectively coupling the plurality of tunable receivers to the plurality of lasers;

selectively coupling the plurality of lasers to the plurality of OXCs; and

selectively coupling the plurality of OXCs to the plurality of WDM MUXs.

63. (Previously Presented) The method as in claim 51, wherein the optical interconnection subsystem is further comprised of a plurality of optical alignment subsystems, a plurality of star couplers, a plurality of wavelength converters (WLCs), a plurality of star couplers for broadcast, a plurality of first WDM MUXs, a plurality of filters, and a plurality of second WDM MUXs, the method further comprising:

tuning the WLCs for converting from a first predefined wavelength to a second predefined wavelength responsive to the CTR; and

configuring the optical interconnection subsystem responsive to the CTR.

64. (Previously Presented) The method as in claim 63,

selectively coupling the plurality of communications links to the plurality of optical alignment subsystems;

selectively coupling the plurality of optical alignment subsystems to the plurality of star couplers;

selectively coupling plurality of the star couplers to the plurality of WLCs;

selectively coupling the plurality of WLCs to the plurality of star couplers for broadcast;

selectively coupling the plurality of star couplers for broadcast to the plurality of first WDM MUXs;

selectively coupling the plurality of first WDM MUXs to the plurality of filters; and

selectively coupling the plurality of filters to the plurality of second WDM MUXs.

65. (Previously Presented) The method as in claim 63, wherein each of the plurality of WLCs are further comprised of a tunable receiver and a tunable laser, the method further comprising:

controlling the tunable receiver and the tunable laser responsive to the CTR.

66. (Previously Presented) The system as in claim 5, wherein each of said subsets of the communications links is coupled to a respective star coupler coupled to a respective WDM for the output.